UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/506,661	09/03/2004	Roman B Hawrylko	1200208US	4779

35227 7590 10/25/2006

POLYONE CORPORATION
33587 WALKER ROAD
AVON LAKE, OH 44012

EXAMINER	
HU, HENRY S	

ART UNIT	PAPER NUMBER
1713	

DATE MAILED: 10/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/506,661	HAWRYLKO ET AL.	
	Examiner	Art Unit	
	Henry S. Hu	1713	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *Pre-Amendment of September 3, 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *9-3-2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. This application **10/506,661** filed on September 3, 2004 is **a CIP of 10/098,241** (now abandoned). It is noted that USPTO has received **Pre-Amendment** and **IDS** (1 page) each filed on September 3, 2004 along with this application. **Claims 1, 6, 9 and 11-12 were amended; new Claims 13-20 were added**, while no claim was cancelled. To be more specific, parent **Claims 1 and 11** were added new limitation as "the essentially pure chalk-like calcium carbonate serves as a "**scavenger for free hydrochloric acid**" generated in poly(vinyl chloride) upon exposure to visible and ultraviolet light", while **Claims 6, 9 and 12** were only amended to remove the improper multiple claim dependency. **Claims 1-20 are now pending** with **two** independent claims (Claim 1 and Claim 11). **No restriction requirement is applied**. An action follows.

DETAILED ACTION

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claims 1-2, 4, 6-7, 11, 13 and 16-17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

(a) On **Claims 6, 7, 16 and 17** each claim at line 2, the term "**at least about**" is a relative term rendering the claim **indefinite**.

(b) On **Claim 1** at line 6, **Claim 11** at lines 3-4 and **Claim 13** at line 2, the term "**less than about**" is a relative term rendering the claim **indefinite**.

(c) On **Claim 1** at lines 4 and 6, **Claim 2** at line 1, **Claim 4** at line 1, **Claim 11** at lines 3 and 7, and **Claim 13** at line 1, the term "**essentially**" is also a relative term rendering the claim **indefinite**.

All above-mentioned **three** different terms are not defined by the claim since it is vague about where is the low limit, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention. See MPEP § 2173.05(b).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. *The limitation of parent* ***Claim 1*** *of the present invention relates to* ***a weather resistant poly(vinyl chloride) compound*** *comprising two components as:*

(a) ***poly(vinyl chloride)*** *and*

(b) at least about 2 weight parts of ***essentially pure chalk-like calcium carbonate*** *per 100 weight parts of poly(vinyl chloride), the calcium carbonate having* ***a particle size less than 10 microns****, wherein the essentially pure chalk-like calcium carbonate serves* ***as a scavenger for free hydrochloric acid*** *generated in poly(vinyl chloride) upon exposure to visible and ultraviolet light.*

Other parent ***Claim 11*** *relates to* ***a process of making*** *poly(vinyl chloride) compound of Claim 1 by* ***mixing****. See other limitations of* ***Claims 2-10 and 12-20****.*

5. Claims 1-4, 6-14 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lehr et al. (US 4,711,921) in view of Hung et al. (US 5,100,946) and Lamond (US 5,102,465).

Regarding the limitation of **two** parent claims including **Claim 1** (composition) and **Claim 11** (process of making a composition), **Lehr** et al. have already disclosed **stabilization of vinyl chloride polymers can be effectively achieved with using barium carbonate and/or cadmium carbonate** (column 1, line 49-56) by permitting the compound used in a processing that require the composition to be heated to moderately high temperatures such as **product forming by injection molding** (column 1, line 38-46). Lehr et al. further disclose the process can be applied to **homopolymer of vinyl chloride, or its copolymer** with other copolymerizable mono-olefin or vinyl-type co-monomers such as styrene or ethylene (column 2, line 17-38).

6. Lehr is still **silent about two things** as: **(A) using calcium carbonate,** and (B) such a calcium carbonate is **essentially pure chalk-like** and has a specific particle size less than 10 μm. With respect to the silent (A), **Hung** et al. teach **halogenated polymer such as poly(vinyl chloride) can be effectively stabilized by including one or more metal-containing compounds to be useful as heat stabilizers wherein the metal can be calcium, barium or cadmium** (column 1, line 35-39; abstract, line 1-5). The advantage is that the existence of such a heat stabilizer will **allow heating up to 250 °C for processing without deterioration or decomposition** (column 1, line 19-23). With respect to the silent (B), **Lamond** teaches **dry ground calcium carbonate from nature resource (which is thereby non-precipitated)** can be

used as filler **in the amount of 10-15 wt%** (see abstract, line 11-12) for polymer such as polyester in the course of molding/compounding (column 2, line 24-38). By doing so, **it is in the form of chalk and will therefore result less sensitive to variations in relative humility and does not promote premature viscosity increase** (abstract, line 1-6). Lamond teach calcium carbonate from **Caribbean** has a **median particle size of 2.0-4.0 microns** (column 3, line 13-16). With respect to other limitation such as "the essentially pure chalk-like calcium carbonate serves **as a scavenger for free hydrochloric acid** generated in poly(vinyl chloride) upon exposure to visible and ultraviolet light", it is only an issue of "**inherent property**".

7. In light of the fact that the existence of **functional equivalence among carbonates of calcium, barium and cadmium as well as extra benefit may be obtained by using a naturally occurred calcium carbonate (may be from Caribbean) being in the form of chalk**, one having ordinary skill in the art would therefore have found it obvious to modify Lehr's poly(vinyl chloride) composition by **replacing the heat stabilizer of barium carbonate or cadmium carbonate with calcium carbonate and further with a chalk type and naturally occurred calcium carbonate such as the one from Caribbean based upon functional interchangeability** as taught by both Hung and Lamond with expectation of success, such a replacement will **not only keep the heat stabilization on molding process, but also get an extra advantage due to the nature of calcium carbonate (which may be from Caribbean) since its form of chalk will allow higher stabilization on humidity change, thereby result no or less viscosity increase during the molding process.**

8. Regarding **Claim 3, Jamaican calcium carbonate** with purity of calcium carbonate over 95 wt% is included according to Lamond's disclosure (column 5, line 37-45).

Regarding **Claims 6-7 and 16-17**, Lehr is **silence about (A) including organotin stabilizer, and (B) including scavenger such as zinc dialkyl ester**. Hung et al. teach both compounds in (A) and (B) can be also included in a heat stabilizer-containing poly(vinyl chloride) composition (column 5, line 37 – column 9, line 52), the advantage is to **prevent decomposition of the polymer during the process procedure to be molded, calendared and extruded** (column 9, line 38-42). Therefore, one having ordinary skill in the art would found it obvious to modify Lehr's poly(vinyl chloride) composition by **including both organotin stabilizer and scavenger such as zinc dialkyl ester** as taught by Hung with an advantage as **such additions will prevent decomposition of the polymer during the process procedure to be molded, calendared and extruded, thereby one would expect to obtain molding articles with better performance due to a consistent and controllable molding procedure.**

Regarding Claims 8 and 18, Lehr discloses that the process can be applied to **homopolymer of vinyl chloride or its copolymer** with other co-polymerizable **mono-olefin or vinyl-type** co-monomers such as styrene or ethylene (column 2, line 17-38).

Regarding **Claims 9-10 and 19-20**, Lehr discloses that the scope of "vinyl chloride polymer" or poly(vinyl chloride) may be **a mixture of homopolymer and/or copolymer**,

wherein copolymer may include co-monomer selected from methyl acrylate or methyl meth-acrylate. Additionally, it may also include post-chlorinated analogues (column 2, line 17-38).

Remaining dependent **Claims 2, 4 and 12-14** are thereby rejected with the same reason for above rejection for Claims 1, 3, 6-11 and 16-20.

10. Claims 5 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lehr et al. (US 4,711,921) in view of Hung et al. (US 5,100,946) and Lamond (US 5,102,465) as applied to Claims 1-4, 6-14 and 16-20, and further in view of Higgs et al. (US 5,880,177).

The rejection of 103(a) over Lehr/(Hung and Lamond) sets forth above for Claims 1-4, 6-14 and 16-20 is incorporated here by reference. Regarding **Claims 5 and 15**, the Lehr/(Hung and Lamond) reference is silent about calcium carbonate is surface treated with a **stearate compound**. **Higgs** et al. teach **inorganic particulate can be surface-treated with a hydrophobising surface treatment agent such as stearic acid or its salts** (column 3, line 1-7), the advantage is **such surface-modified inorganic particulate is suitable to be incorporated in a composition comprising a hydrophobic polymeric material due to better compatibility** (abstract, line 1-6).

11. Therefore, one having ordinary skill in the art would found it obvious to modify Lehr/(Hung and Lamond)'s poly(vinyl chloride) composition by **including a stearate-treated Caribbean calcium carbonate** as taught by Higgs with an advantage as **such surface-modified**

calcium carbonate will be more suitable to be incorporated in a composition comprising the hydrophobic poly(vinyl chloride) due to better compatibility between polymer and filler, thereby one would expect to obtain molding articles with better performance due to a homoheneous, consistent and controllable molding procedure.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure. The following references relate to a weather resistant poly(vinyl chloride) compound comprising poly(vinyl chloride) and at least about 2 weight parts of essentially pure chalk-like calcium carbonate:

US Patent No. 5,948,492 to Cargile discloses a procedure to **make a blow-molded plastic container comprising a homogeneous mixture of a plastic resin, filler such as calcium carbonate and a blowing agent** (abstract, line 1-5). However, the polymer **does not include poly(vinyl chloride) or copolymer, and he does not mention the use of calcium carbonate in the form of chalk such as from Caribbean.** Therefore, Cargile fails to teach the limitation of present invention.

13. Any inquiry concerning this communication or earlier communication from the examiner should be directed to **Dr. Henry S. Hu whose telephone number is (571) 272-1103**. The examiner can be reached on Monday through Friday from 9:00 AM –5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on (571) 272-1114. The **fax** number for the organization where this application or proceeding is assigned is **(571) 273-8300** for all regular communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Henry S. Hu

Patent Examiner, art unit 1713, USPTO

October 24, 2006

DAVID W. WU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700